Info LA-SP Technical Data

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News From: La Belle

General Command Format

Any La Belle Info Series programmable display includes 21 display modes (rotate, wipe, scroll, etc.) and functions (time, date, wide characters, etc.), as well as 10 built-in graphics (airplane, truck, etc.)

Info Series units with the suffix "SP" include identical modes, functions, and graphics with the addition of "Serial Command Mode". Serial Command Mode enables each of the displays in a network to communicate with each other, and to accept commands from the master (send) unit.

Begin by programming your message as you would with an ordinary La Belle Info unit, and store it in the memory of the master (send) unit (M1-M5). Next, enter into Serial Command Mode.

- **TO ENTER SERIAL COMMAND MODE, HOLD ALT AND PRESS F2.**
  - To change command position, press left or right arrows (black). The position to be changed will blink.
  - To change command or numerical value, hold shift and press up or down arrows (white).
- **TO SEND A COMMAND TO OTHER UNITS HOLD ALT AND PRESS F2.**

There are eight (8) serial commands to run the RS485 network. They are as follows:

RUN CONTINUOUS (R) - Message runs beginning to end, then starts again. In this example, the units 00 through 31 will run the message on memory 3. Units without a message on memory 3 will remain idle. (To put a message in a memory see PUT.)

RUN ONCE (O) - Message runs beginning to end, then stops, or returns to RUN CONTINUOUS or TICKERTAPE, whichever command was previously operating. In this example, units 00 through 31 will run memory 1. Units without a message in memory 1 will be idle. (To put a message in a memory see PUT.)

TICKERTAPE (T) - Message runs beginning to end, and is discarded from memory. In this example, the message came from memory 5 on this (master) unit and was sent to units 12 through 16. TICKERTAPE will not destroy messages stored in memories M1-M5.

IDLE (I) - Idle indicates a clear screen in the status command (see STATUS). It can also be used to abort any other command in progress, here units 00 through 31.

STATUS (S) - Requests the status of a particular unit. A reply will appear on the screen as: RUN, EDIT, ONCE, TICK, IDLE, or SERIAL. The unit whose STATUS was requested will be identified by its' address number on the left with the memory number of the message on the right of the reply. An EDIT or SERIAL reply indicates that someone else is on the unit from which STATUS was requested.

PUT (P) - This sends a message to a memory (M1-M5) on a particular unit or units. In this case, the message in memory 4 of the master (send) unit is put in memory 2 of units 00 through 31.

GET (G) - Gets a message from a selected memory on a selected unit and puts it in the memory of the master (send) unit. In this case, memory 1 from unit 05 will be put into memory 5 of the master (send) unit.

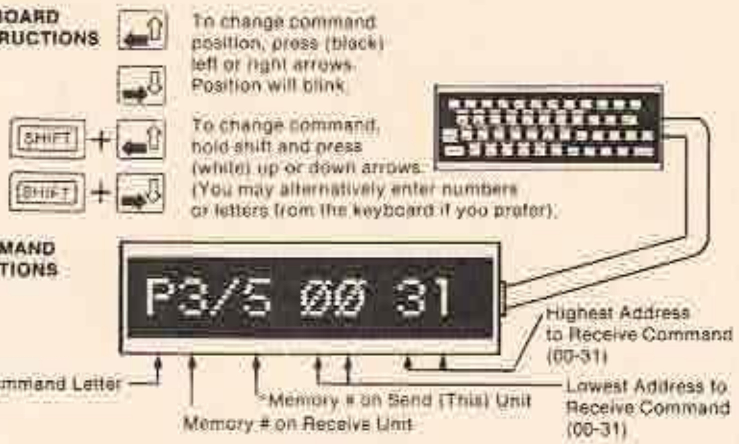
CLOCK (C) - Set the time, day and date in normal command mode. Switch to Serial Command Mode, program CLOCK command, and set the clock in selected units - here 00 through 31.

KEYBOARD INSTRUCTIONS

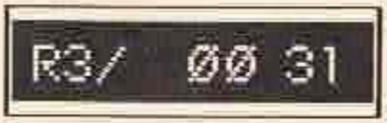
To change command position, press (black) left or right arrows. Position will blink.

To change command, hold shift and press (white) up or down arrows. (You may alternatively enter numbers or letters from the keyboard if you prefer).

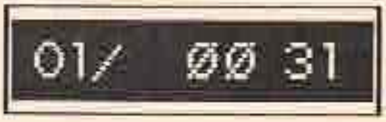
COMMAND POSITIONS


SHIFT
SHIFT
P3/5 00 31
Command Letter
Memory # on Receive Unit
Memory # on Send (This) Unit
Lowest Address to Receive Command (00-31)
Highest Address to Receive Command (00-31)

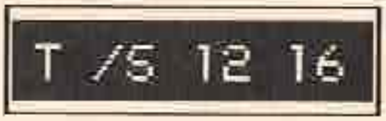
RUN CONTINUOUS



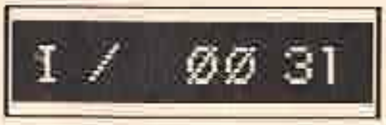
RUN ONCE



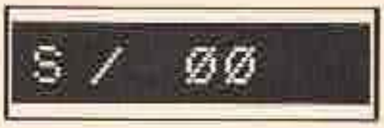
TICKERTAPE



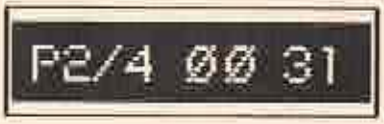
IDLE



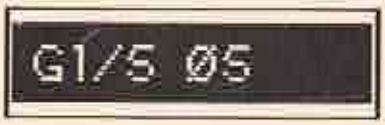
STATUS



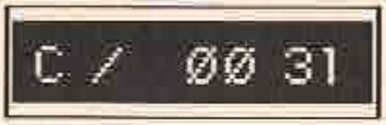
PUT



GET



CLOCK



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Serial Port System Examples

RS485 Network

In the RS485 network up to 32 signs can be arranged in a system that extends up to 4,000 feet end-to-end. Using the La Belle typewriter format keypad from a single location, you can program and control any or all signs in the network. Each unit is assigned an individual address (00-31) that can be reached individually, in groups, or as an entire system. La Belle's RS485 network is unique in that it allows for any sign in the network to be a "master" or "send" unit in contrast to other systems that are set up with only one master sign, the rest being slaves.

Setting up an RS485 network throughout a building is similar to installing telephones and extensions. The network wiring is based on common 4-connect telephone wire (twisted pair for maximum specifications) and RJ-11 modular jacks and connectors. The wire and connectors are available at your local hardware store or phone center. They can also be purchased from La Belle in 5 and 10 unit kits.

A 25-foot Master Cable (RJ-11 to RJ-11) is used to connect the first sign in a system to the rest of the network. It is imperative that the Master Cable be used at the front end of the network because the wires are arranged differently from the others. The Master Cable proceeds to the first In-Line Terminator which is located before the second sign in a simple RS232 network. The next cable comes from the In-Line Terminator and connects to the single end of the first Tee connector. On the double end of the Tee connector, one side branches off to the second system sign, while the other side continues along "centralized line" to the single end of the next Tee connector and so on. (see illustration for details) It is recommended that all lines branching off from the "centralized line" be as short as possible, especially in systems where the maximum number of units (32) and maximum system length (4,000 feet end-to-end) are used. The last sign in a system is connected by a second In-Line Terminator instead of a Tee connector. In-Line Terminators are used at each end of a network to absorb reflected "noise" that is created by message interaction. All sign switches will be set in the RS485 configuration.

5 and 10 unit system kits are available from La Belle and include all sub-assembly parts (less wire) needed for 5 and 10 unit networks. 4-connect telephone wire can be ordered from La Belle, as well as individual parts for add-ons.

RS232 Phone Modem

By using La Belle's Info SP sign (RS232 Configuration) in conjunction with a telephone modem, loading from one sign to another can occur over the telephone between any two points that have normal telephone service. This makes it possible to program a sign at your location and transmit that same program to another sign virtually anywhere.

Depending on your particular application, either an acoustic modem or a direct connect modem will be used.

An acoustic modem requires that someone is there, both to dial the phone and to answer it. The person answering the phone physically places the telephone receiver on the modem and proceeds to load the sign. Acoustic modems are relatively inexpensive and can be purchased at your local computer store.

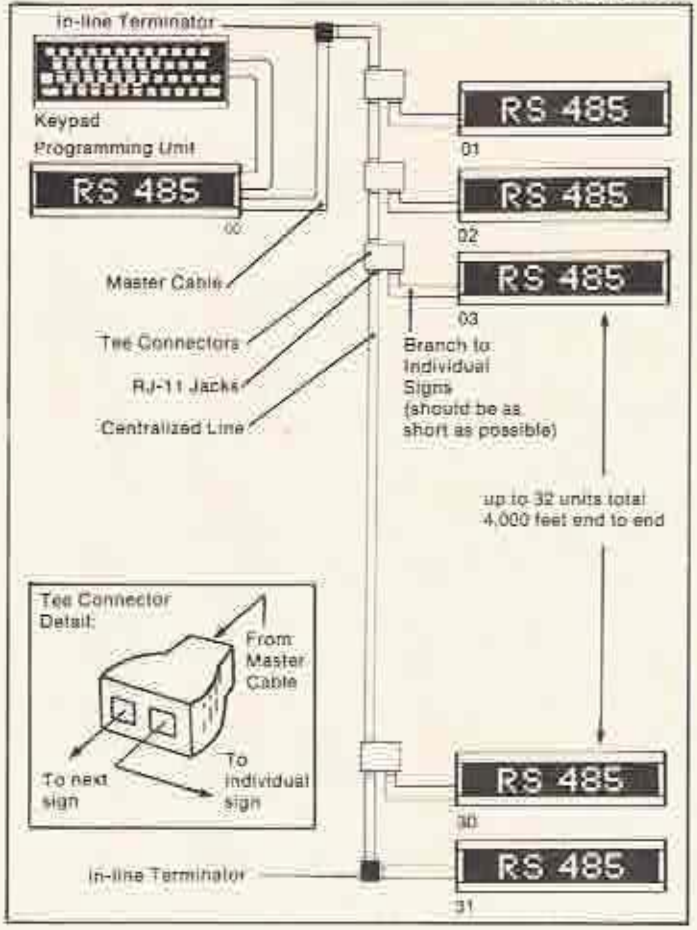
A direct connect modem is used to directly link two signs at different locations in the phone system. It can also be used together with a PC or compatible computer. In most cases, existing telephones can be used to load signs during off-hours. If you wish the modem to answer the phone automatically, an extension may have to be set aside on your phone system.

When using any modem, be sure that the baud rate on your signs are set to match the baud rate on the modem. La Belle has available a DB-25 to RJ-11 connector to link the modem to the sign. When ordering specify a male or female DB-25 end. (Most modems require a male DB-25 cable end, but check yours to be sure.) When switching for DTE or DCE, check the orientation of your modem. Info SP switches will be set to make the sign look like DTE (Data Terminal Equipment) for most modems.

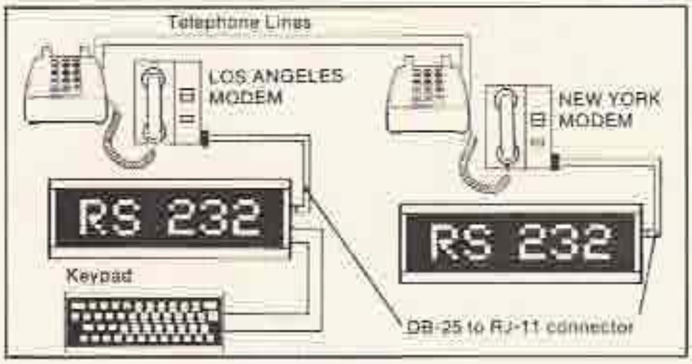
RS232 PC Interface

Using a similar RS232 internal configuration it is possible to control a sign using an IBM PC or compatible computer. This opens up a wide variety of possibilities, including storing many

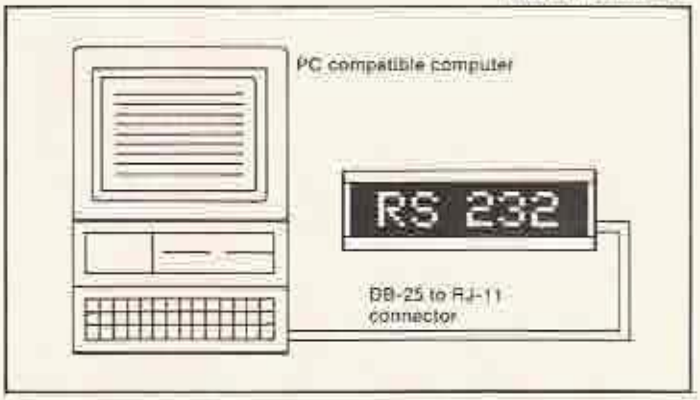
RS485 Network



RS232 Phone Modem



RS232 PC Interface



messages in the computer and timing the release of those messages. You will also be able to create and edit messages from the computer keyboard or reroute incoming information from various news sources. The PC can be used in conjunction with a telephone modem to automatically program signs at other locations, or insert display modes and functions into a large body of copy.

To connect a sign to your PC or compatible, La Belle offers a DB-25 to RJ-11 cable that comes with either a male or female DB-25 end. Most computers use female DB-25, but check your port to be sure. Be sure to set the baud rate on your sign to match the baud rate of your computer. With most PC applications, the switches on the sign are set to look like DCE (Data Communications Equipment). Check your PC or compatible to be sure.

RS232 PC to RS485 Network

By connecting a La Belle RS232 to RS485 Convertor from an IBM PC or compatible computer to a regular RS485 network, you are now able to control a network of up to 32 signs in a system up to 4,000 feet long end-to-end with your computer.

Using the computer enables you to create and edit messages from the keyboard, store and time the release of messages, and reroute information from various news sources. Programs will be available to do all this plus automatically insert display modes and functions. The PC can also automatically reach other networks in other cities using the RS232 phone modem.

As with the standard RS485 network, all signs are individually addressable (00-31) and are installed using standard 4-connect telephone wire with RJ-11 modular jacks.

The La Belle RS232 to RS485 Convertor is connected to the PC or compatible computer using a DB-25 to DB-25 cable. The Master Cable is connected to the other end of the RS232 to RS485 Convertor, then to the Tee connector for the first sign in the system. The last sign in the system is connected by a second In-Line Terminator instead of a Tee connector as is the case with the standard RS485 network.

As always, check to be sure that all units are operating at the same baud rate as the computer. All Info SP switches should be set in the RS485 configuration. No In-Line Terminator is needed at the beginning of the system, as it is built-in to the RS232 to RS485 Convertor.

RS232 Modem to RS485 Network

In this configuration, a single sign on a phone modem can control a network of signs in another location using normal telephone service.

The sign and keypad in the example at the right are located in Los Angeles. The sign is set up for RS232 with a phone modem including matching baud rates with the sign being DTE (in most cases). The call is made to New York where there is an RS485 network, and is received by a matching phone modem that is connected to an RS232 to RS485 Convertor. The convertor changes RS232 information from the phone modem into commands and messages on the RS485 network.

Peripheral equipment needed for this arrangement is available from La Belle, including an RS232 to RS485 Convertor, DB-25 to RJ-11 cable (specify male or female), and unit kits for the RS485 network. A DB-25 to DB-25 cable can be obtained from your local computer store, or from La Belle if you prefer.

This system can also interface with an IBM PC or compatible.

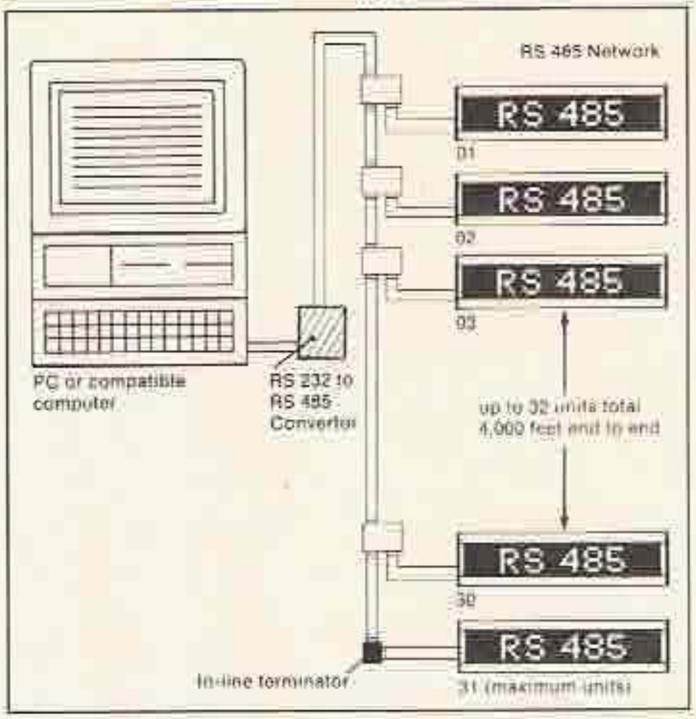
Serial Port Repeater

Any RS485 network can be extended an additional 4,000 feet and/or another 32 units by installing a La Belle Serial Port Repeater in the system. This is especially useful for networks that must span a long distance, or must include more than 32 units.

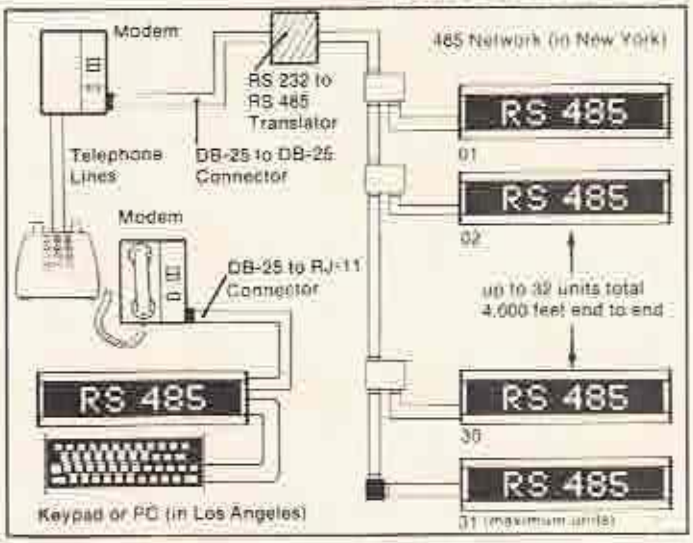
The Serial Port Repeater is placed after the 32nd unit in the system, and/or after the 4,000 feet maximum is reached in a system with less than 32 units. No In-Line Terminator is required immediately near the Repeater, as it is built-in. At this time, only 32 addresses are available, which means that in a 64 unit system two signs must share one address.

When installing a system of this size, contact La Belle for more information on economic use of components that fit your particular application.

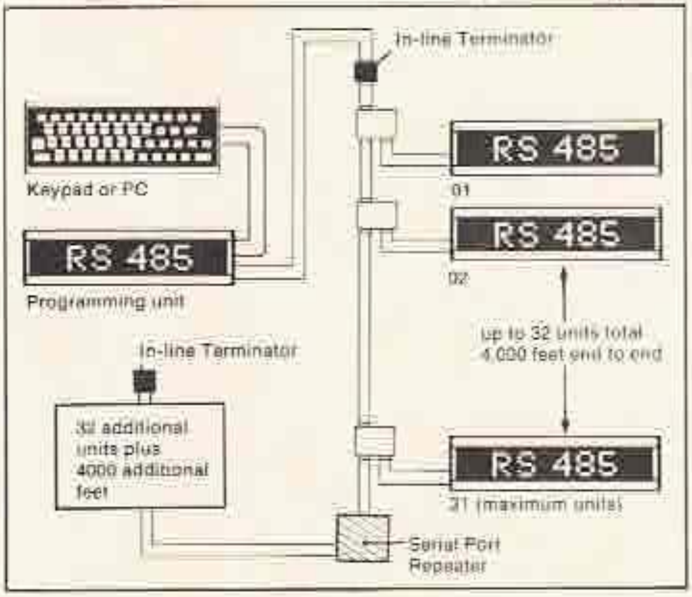
RS232 Modem to RS485 Network


RS 485 Network
RS 485
01
RS 485
02
RS 485
03
PC or compatible computer
RS 232 to RS 485 Convertor
up to 32 units total 4,000 feet end to end
RS 485
30
RS 485
In-line terminator
31 (maximum units)

RS232 PC to RS485 Network



Serial Port Repeater



Switch Layout

Info Series SP units are capable of RS485 (a network of signs) or RS232 (interface with a PC or phone modem), depending on the configuration of the switches located inside the unit.

To arrange switches in proper configuration, unplug the unit and carefully lay it on its' face. Use a screwdriver to remove the hatch door screw, and open. Notice the 8-position dip switches located on either side of the IC. The switches can be set to an ON (up) or OFF (down) position by reaching inside with a ball point pen and sliding the switch up or down. (Make note of where the top of the display is located in relation to the illustrations to properly orient the switch locations.)

RS485 Configuration

RS485 allows for up to 32 signs to be interconnected in an addressable network. To set the switches for RS485 (including individual addresses):

LEFT:
1. On for RS485
2. On for RS485
3. Off for RS485
4. Off for RS485
5. Off for RS485
6. On for 2400 Baud
7. On for 300 Baud
8. On for 1200 Baud

Select one of the three; turn the other two off.

RIGHT:
1. Least Significant Address
2. Address
3. Address
4. Address
5. Most Significant Address
6. Reserved for Future Use
7. Reserved for Future Use
8. Off for RS485 (Network)

Binary switch positions for address of individual signs (right dipswitch, numbers 1-5):

N=ON
F=OFF

UNIT ADDRESS NUMBER:	SWITCH NUMBER 5	4	3	2	1		SWITCH NUMBER 5	4	3	2	1		SWITCH NUMBER 5	4	3	2	1
00	F	F	F	F	F	11	F	N	F	N	N	22	N	F	N	N	F
01	F	F	F	F	N	12	F	N	N	F	F	23	N	F	N	N	N
02	F	F	F	N	F	13	F	N	N	F	N	24	N	N	F	F	F
03	F	F	F	N	N	14	F	N	N	N	F	25	N	N	F	F	N
04	F	F	N	F	F	15	F	N	N	N	N	26	N	N	F	N	F
05	F	F	N	F	N	16	N	F	F	F	F	27	N	N	F	N	N
06	F	F	N	N	F	17	N	F	F	F	N	28	N	N	N	F	F
07	F	F	N	N	N	18	N	F	F	N	F	29	N	N	N	F	N
08	F	N	F	F	F	19	N	F	F	N	N	30	N	N	N	N	F
09	F	N	F	F	N	20	N	F	N	F	F	31	N	N	N	N	N
10	F	N	F	N	F	21	N	F	N	F	N						

RS232 Configuration

RS232 allows for interface with a personal computer or telephone modem. To set the switches for RS232:

LEFT:
1. Off for RS232
2. On for DCE
3. On for DTE
4. On for DCE
5. On for DTE

Select Either DTE or DCE; turn the others off.

6. On for 2400 Baud
7. On for 300 Baud
8. On for 1200 Baud

Select one of the three; turn the other two off.

RIGHT:
1. Echo Enable On/Disable Off
2. Parity Enable On/Disable Off
3. Stop 2 On/1 Off
4. Parity Even On/Odd Off
5. Data Bits 8 On/7 Off
6. Reserved for Future Use
7. Reserved for Future Use
8. On for RS232 (Single)

Technical Parameters/Pinouts

For the RS485 transceiver network to operate, RJ-11 modular jacks with telephone cord or twisted pair wire are used. (For maximum distance, use twisted pair wire.)

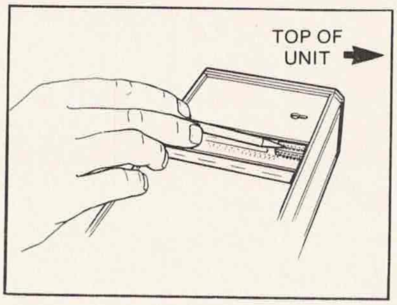
Maximum System Length: 4,000 feet, end-to end
Maximum Units per System: 32

System length can be extended to another 4,000 feet using La Belle's Repeater Module. Maximum units per system can be expanded in increments of 32 or less using the same La Belle Repeater Module. At this time, however, only 32 addresses are available, which means in an extended system, some units would have to share an address.

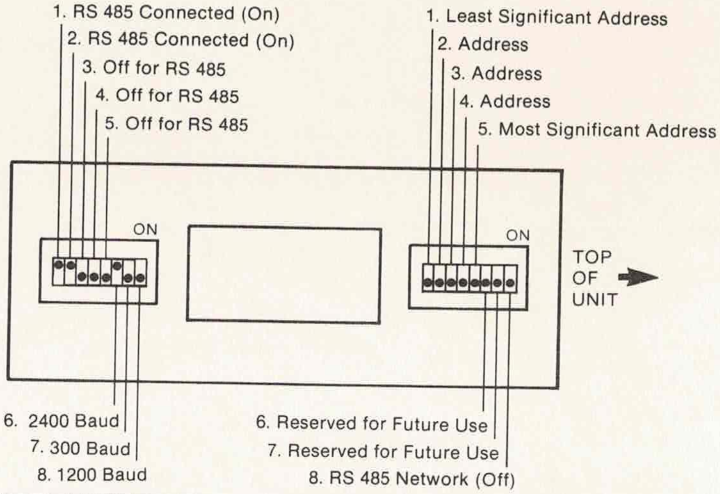
When twisted pair wire is used, connect TXRX + Common, and TXRX - Common. Ground connection not necessary for RS485. Contact La Belle for modular wire and jack kits.

For RS232 interface with a personal computer, a DB-25 to RJ-11 connector must be used. When ordering, specify a male or female DB-25 connector.

LOCATION

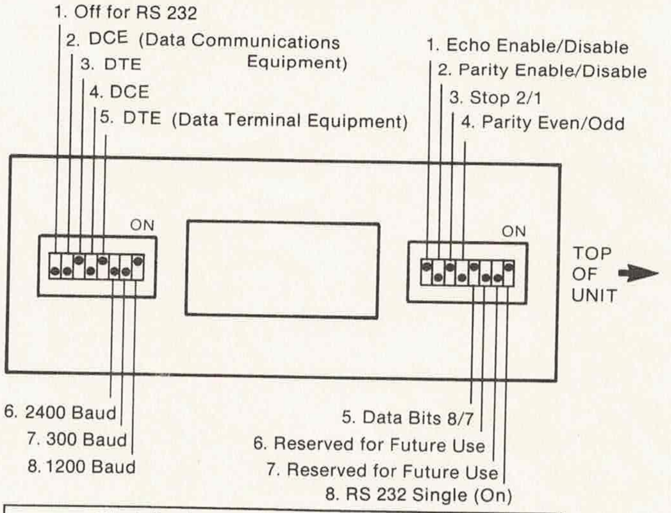


RS 485



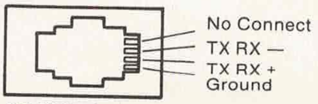
The following values are preset for Network:
8 Data Bits, 2 Stop Bits, No Parity.

RS 232



The following applies to single units:
Address number for single unit is always 00.

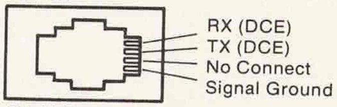
RS 485



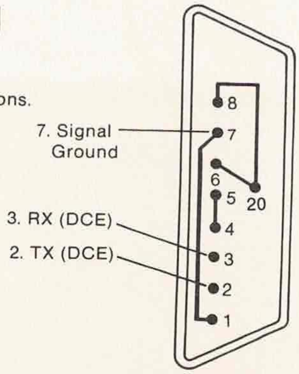
RJ-11 Port

A DB-25 to RJ-11 Connector is used for RS 232 applications.

RS 232



RJ-11 Port



DB-25 (for RS 232)

General Command Format
(Detailed)

All Info Series SP units use this detailed General Command Format, but it has been simplified for use with the La Belle Info keypad. The following information is provided primarily for users of the RS232 personal computer interface.

- To signal the beginning of a command sequence, ASCII "Escape" (1B Hex) is used as the attention character.
- To signal the end of a command sequence, ASCII "End of Text" (3 Hex) is used as the end of message character.
- Beginning Unit Address signifies the lowest unit address that will accept this command.
- Ending Unit Address signifies the highest unit address that will accept this command.
- Sender's Address represents the address of the unit that you are working on.
- Command represents one of eight external commands that are identified by the following list of command examples.
- Memory Number stands for the memory number (1-5) on the units that are receiving this command. This number is not necessary in all cases, as described below.

Command Examples

RUN CONTINUOUS (R) - The message in a selected memory runs beginning to end, then cycles over again and again. A message must be put (see PUT) into the selected memory number (1-5) of the receiving unit(s) before RUN CONTINUOUS can operate. The message is stored in the same memory number unless it is replaced by a new message in that memory with the PUT command.

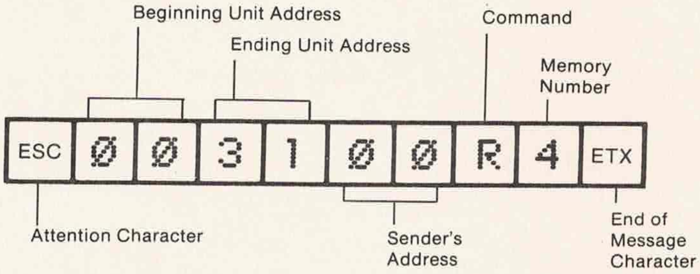
ONCE (O) - The message in a selected memory runs beginning to end, then stops, returning the screen to an IDLE state, or returns to RUN CONTINUOUS or TICKERTAPE, whichever command was operating previously. A message must be put (see PUT) into the selected memory number (1-5) of the receiving unit(s) before ONCE can operate. The message is stored in the same memory number for future use unless it is replaced by a new message with the PUT command.

TICKERTAPE (T) - The message that follows this command is displayed on the screen in the order that it is sent (as opposed to being in a selectable memory number) and is immediately discarded from memory as it leaves the screen. The screen will continue to TICKERTAPE until the entire message is broadcast, even if the information comes in faster than it can be displayed. You can interrupt the TICKERTAPE command with an O (ONCE) and return to TICKERTAPE by sending another T (TICKERTAPE) command with or without more information. After the message is complete, TICKERTAPE will return to an IDLE state.

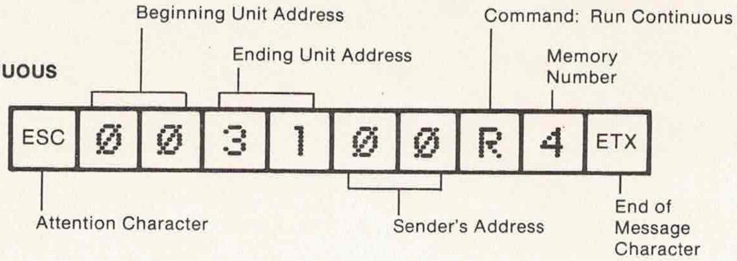
IDLE (I) - IDLE indicates that the screen is blank when a status request is received on a particular unit (see STATUS). IDLE can also be used to abort any other command in progress on selected unit(s).

STATUS (S) - Requests the status of a particular unit. Replies on the sender's screen will appear as: EDIT or SERIAL (which means someone else has put a programmer in the system besides you), RUN, ONCE, TICK, or IDLE.

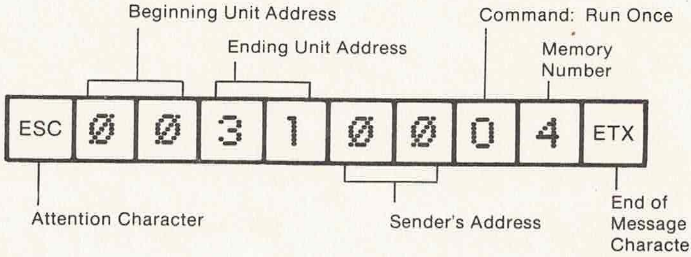
GENERAL COMMAND FORMAT



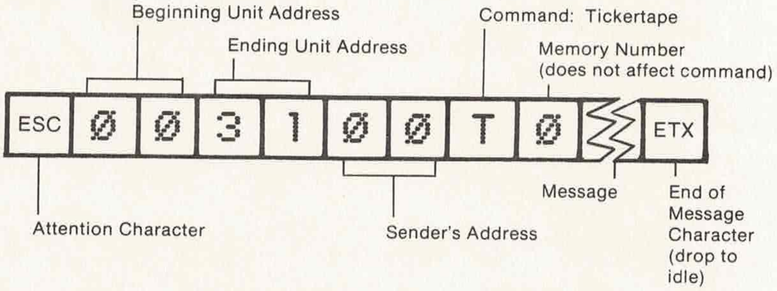
RUN CONTINUOUS



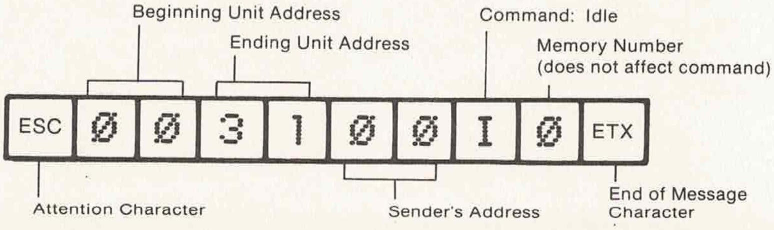
RUN ONCE



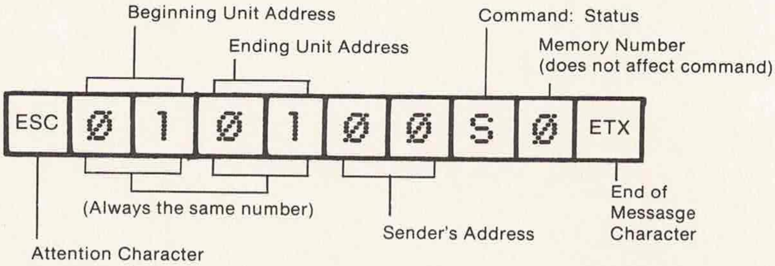
TICKER-TAPE



IDLE



STATUS



STATUS ACKNOWLEDGE (A) - This is an internal command that cannot be generated from the keyboard. The display uses this command to respond to a STATUS request (see STATUS).

PUT (P) - The message following a PUT command is sent to a selected memory (1-5) on the selected unit(s). The message remains in that memory for use by a RUN CONTINUOUS or ONCE command. After running continous or running once, the message is retained in the memory for future use, unless it is replaced by another PUT command to the same memory.

GET (G) - This command gets a message from a distant unit memory and puts it on the memory of the master (send) unit. It's useful for editing a message, or adding information to a message that already exists. GET only operates on one distant unit at a time. The GET command automatically elicits a PUT response (see PUT) from the selected distant unit.

CLOCK (C) - Sets the clock on all or any units. Month, hour, day and minute must all be two (2) characters each. The clock operates on 12 hour time using "A" or "P" (AM or PM). Day of the week begins with Sunday being represented by the number one (1) in the message format. The month starts with January as number one. (Both the day of the week and the month are spelled out on the display screen.)

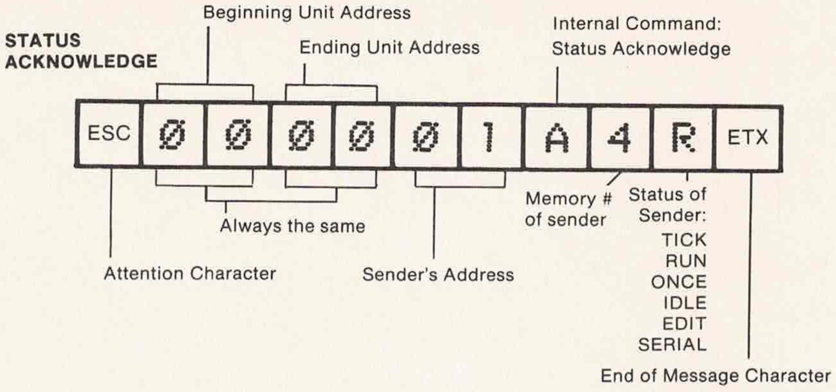
Message Format

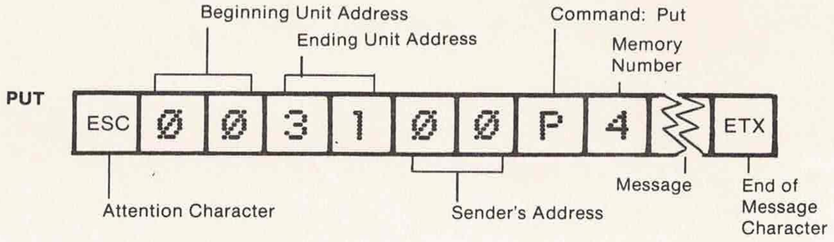
Messages must be placed in two (2) of the above commands, PUT and TICKERTAPE. Message modes (flash, scroll, rotate, etc.) must be preceded by a backslash (\) and the appropriate abbreviation for the mode. (Example: Rotate left would be \RL; see chart for complete details.) The alphanumeric portions of the message are represented by their ASCII equivalent character codes.

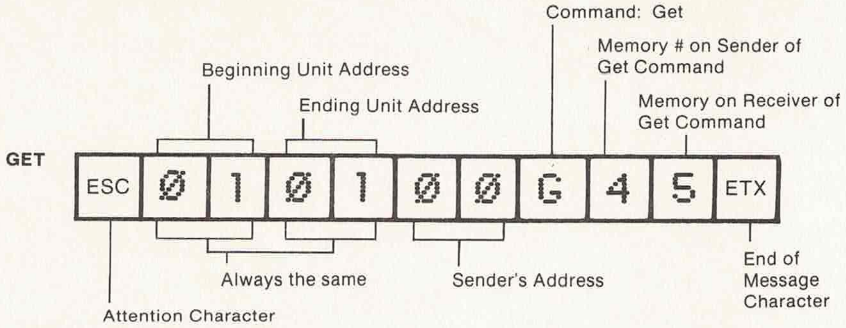
ASCII Character Set

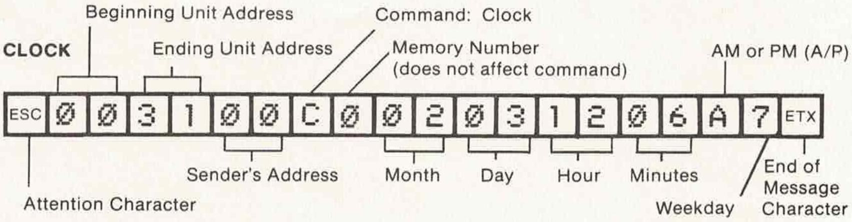
LSD	MSD	0 000	1 001	2 010	3 011	4 100	5 101	6 110	7 111
0	0000			SP	0	¢	P		
1	0001			!	1	A	Q		
2	0010			"	2	B	R		
3	0011	ETX		#	3	C	S		
4	0100			$	4	D	T		
5	0101			%	5	E	U		
6	0110			&	6	F	V		
7	0111			'	7	G	W		
8	1000			(	8	H	X		
9	1001			)	9	I	Y		
A	1010			*	:	J	Z		
B	1011		ESC	+	;	K			
C	1100			,	<	L	\		
D	1101			—	=	M			
E	1110			.	>	N			
F	1111			/	?	O			

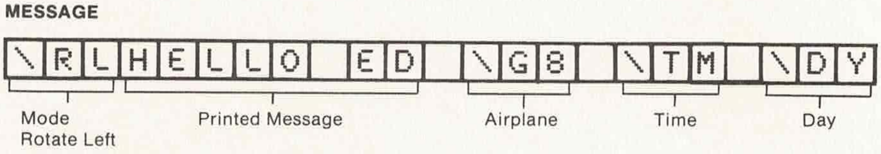
ASCII lowercase reads as uppercase in La Belle Info Displays. Display modes, Graphics, Functions must be upper case.











DISPLAY MODES		GRAPHICS		FUNCTIONS	
Rotate Left	\RL	Heart	\G1	Time	\TM
Rotate Right	\RR	Arrow Up	\G2	Day	\DY
Kick Off	\KF	Arrow Down	\G3	Date	\DT
Kick On	\KN	Arrow Left	\G4	Wide On	\WN
Wipe	\WP	Arrow Right	\G5	Wide Off	\WF
Open	\OP	Person	\G6	Speed Fast	\SF
Close	\CL	Auto	\G7	Speed Slow	\SS
Drop	\DR	Airplane	\G8		
Hold	\HL	Truck	\G9		
Hold Up	\HU	Welcome	\G0		
Hold Down	\HD	Half Space	\HF		
Scroll Up	\SU				
Scroll Down	\SD				
Blink	\BL				
Flash	\FL				
Random	\RM				

PART NUMBER	PART	DESCRIPTION
61-914	Serial Port Option	Any La Belle Info unit with the suffix "SP" that includes RS232 and RS485 capabilities. Standard 7600 character memory. RJ-11 port located next to regular keypad port on the side of the unit.
61-934	DB-25 (Male) to RJ-11 Adapter	For interface with PC or modem. (Most modems use a male DB-25). Includes 25 foot cable.
61-945	DB-25 (Female) to RJ-11 Adapter	For interface with PC or Modem. (Most PC's and compatibles use Female DB-25). Includes 25 foot cable.
61-943	5 unit network kit	Includes sub-assembly parts (less wire) for 5 unit network. Crimping tool (for attaching RJ-11 jacks to wire), 25 foot master cable (for use at the front end of the network), 3 tees (for splitting from main wire), 20 RJ-11 modular jacks, 2 in-line terminators (for installation at the beginning and the end of the system).
61-944	10 unit network kit	Includes sub-assembly parts (less wire) for 10 unit network. Crimping tool (for attaching RJ-11 jacks to wire), 25 foot master cable (for use at the front end of the network), 8 tees (for splitting from main wire), 40 RJ-11 modular jacks, two in-line terminators (for installation at the beginning and the end of the system).
61-948	Master cable - 25 foot	25 foot cable with RJ-11 jacks on each end for use at the beginning of a network (1 per network).
14-694	RJ-11 Tee Connector	RJ-11 jack that splits the main wire to connect with individual units in the network (1 per unit in the network minus the first and last sign).
14-695	RJ-11 In-Line Connector	RJ-11 to RJ-11 splice for extending the length of any cable (if necessary). For use in network applications.
61-947	RJ-11 In-Line Terminator	For installation of the first and last signs in a network (2 per system).
14-653	RJ-11 Connector	RJ-11 modular jack connector. Four required for each sign in the network.

PART NUMBER	PART	DESCRIPTION
9-116	4 Conductor Telephone Wire	Standard wire used to connect a network of signs.
61-146	Crimping Tool	Tool for attaching RJ-11 jacks to wire (1 per network).
61-927	DC Car Adapter	Runs any Info sign on a 12 volt system (lighter plug).
61-942	20 ft. keypad extension cable	Extends standard keypad length to a total of 26 feet.
61-917	Keypad w/6 foot cable	Extends the length of La Belle keypad to sign 6 feet.
61-946	Keypad w/25 foot cable	Extends the length of La Belle keypad to sign 25 feet.
	8K Memory expansion	Changes standard 1600 character memory in all Info units to 7600 characters. Standard in serial port models.
61-958	RS232 to RS485 Converter	Allows PC or Modem interface on serial port units to connect to a complete network.
61-959	Serial Port Repeater	Extends standard network capacity of 32 signs in increments of 32 for each repeater added to the system. Will also extend standard network range of 4,000 feet end-to-end another 4,000 feet for each repeater added to the system.